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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/540,708	06/24/2005	Dirk Dc Bruin	NL 021415	2481

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EXAMINER
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RAINEY, ROBERT R

ART UNIT	PAPER NUMBER
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2629

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12/05/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/540,708	DE BRUIN ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Robert R. Rainey	2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 30 May 2006.
- 2a) This action is FINAL.                            2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-11 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 24 June 2005 is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All    b) Some \* c) None of:
  1. Certified copies of the priority documents have been received.
  2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 5-30-06, 624-06
- 4) Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) Notice of Informal Patent Application
- 6) Other: \_\_\_\_\_

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. **Claims 1 – 6 and 10 rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 6,288,695 to Wood ("Wood").**

As to **claim 1**, Wood discloses a field emission display device and a method for driving same and in particular: A display device having a set of non-pixel-selective electrodes (1a, 1b) (see for example Figs. 1 and 3 item 16), and a set of pixel-selective electrodes (2a, 2b, 2c) (see for example Fig. 1 and 3 item 14), pixels (15) being defined by intersections of said electrodes (see for example Figs. 1 item 30), characterized by means (3, 4a, 4b, 5, 6, 7) for applying an amplitude modulated (AM) signal to a non-pixel-selective electrode (1a, 1b) (see for example Figs. 3 and 5 and column 5 line 42 to column 6 line 20, especially column 6 lines 12-15 where a change in the gate voltage is mentioned), and means (10a, 10b, 11, 13) for applying a pulse width modulated (PWM) signal to a pixel-selective electrode (2a, 2b, 2c) (see for example Figs. 3 and 5 and column

5 lines 42-54, note that switches 62 are closed for 1 or more bit times to create the desired gray level).

As to **claim 2**, Wood further discloses that the brightness is controlled according to the bit rank of the video words and that each brightness level includes a particular gate voltage level, while Wood does not use the term "memory" to describe the functional element that stores the relationship between video words and gate voltage levels, the fact that video words are mapped to a particular sequence of gate voltage levels requires that the appropriate mapping be remembered thus requiring: a memory for storing a predefined amplitude curve (see for example Figs. 3 and 5 and column 5 line 42 to column 6 line 20).

As to **claim 3**, Wood further discloses that the means for applying an AM signal comprises analogue electronics (see for example column 7 lines 13-25, which discloses a light sensor, an inherently analog component, to monitor and adjust the gate voltage levels).

As to **claim 4**, Wood further discloses said non-pixel-selective electrodes are the row electrodes of the display (see for example Figs. 1 and 5).

As to **claim 5**, Wood further discloses that each pixel comprises a field emitter connected to a pixel-selective electrode (see for example Fig. 1 items 28)

and wherein the non-pixel-selective electrode acts as a gate electrode (see for example Fig. 1 items 16 and column 2 line 6).

**Claim 6** is a claim to the method implicit in the apparatus claimed in claim 1 and is rejected on the same grounds and arguments.

As to **claim 10**, in addition to the rejection of claim 6, *Wood* further discloses that the amplitude curve of the AM signal is alternated between consecutive frames (see for example column 5 line 42 to column 6 line 20 noting that the AM signal is cycled through a sequence of amplitudes corresponding to a number of frames).

#### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. **Claims 7-9 and 11** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,288,695 to *Wood* ("Wood") in view of U.S. Patent No. 4,554,539 to *Graves* ("Graves").

As to **claim 7**, in addition to the rejection of claim 6 over *Wood*:

*Wood* does not expressly disclose that the AM signal is increased from a threshold value to a maximum value during a line period.

*Graves* discloses that the AM signal is increased from a threshold value to a maximum value during a line period (see for example Fig. 4 and column 3 lines 28-40).

*Wood* and *Graves* are analogous art because they are from the same field of endeavor, which is user interface displays with line-at-a-time addressing.

At the time of invention, it would have been obvious to a person of ordinary skill in the art to use the gray scale generation method of *Graves* with the FED disclosed by *Wood*. The suggestion/motivation would have been to provide advantages such as to reduce the display time by reducing the number of times all rows needed to be scanned or to provide a driver circuit with low power dissipation (see for example *Graves* column 2 line 22).

As to **claim 8**, in addition to the rejection of claim 6 over *Wood*, *Wood* further discloses the AM signal alternating by frame.

*Wood* does not expressly disclose the amplitude curve of the AM signal is alternated between consecutive line periods.

*Graves* discloses the AM signal ramping within a line period (see for example Fig. 4 and column 3 lines 28-40) and that negative images of the driving signals can be used in place of the positive ones (see for example column 4 lines 61-62).

*Wood* and *Graves* are analogous art because they are from the same field of endeavor, which is user interface displays with line-at-a-time addressing.

The cited references disclose the claimed invention with the exception of alternating the signal between consecutive line periods. The method of *Graves* does not require that the slope of the ramp be either positive or negative but would work equally well with both and specifically suggests the applicability of negative images of the described signals. Therefore the selection of a positive or negative slope to the ramp is a matter of design choice. At the time of invention, it would have been obvious to a person of ordinary skill in the art to use the gray scale generation method of *Graves* with the FED disclosed by *Wood* and further to alternate between positively and negatively sloped ramps as desired including each line period. The suggestion/motivation would have been to provide advantages such as to avoid discontinuity in the driving function and to thereby reduce such negative effects as reset time or current or voltage spikes or to save power by avoiding unnecessary voltage transitions.

As to **claim 9**, in addition to the rejection of claim 8 no further arguments are required since the further limitations introduced by claim 9 were already covered in the rejection of claim 8. Therefore, claim 9 is rejected on the same grounds and arguments as claim 8.

As to **claim 11**, in addition to the rejection of claim 6 over *Wood*:

*Wood* does not expressly disclose that the PWM signal is applied to the pixel-selective electrode first, and the AM signal is applied to the non-pixel-selective electrode when the rise-time of the PWM signal has passed.

*Graves* discloses the AM signal ramping within a line period (see for example Fig. 4 and column 3 lines 28-40) and pulse position modulation (PPM) or the placement of the column pulse at such a position so as to be combined with the row voltage signal such that the desired brightness is achieved (see for example column 4 lines 29-61 or column 2 lines 29-36).

*Wood* and *Graves* are analogous art because they are from the same field of endeavor, which is user interface displays with line-at-a-time addressing.

At the time of invention, it would have been obvious to a person of ordinary skill in the art to use the gray scale generation method of *Graves* with the FED disclosed by *Wood* and further to position the gate pulse in time with respect to the ramp signal in such a manner so as to produce the desired gray scale level as disclosed by *Graves*. Since it has been held that if the general conditions of the claim, i.e. the positioning of the gate pulse with respect to the AM signal in order to achieve the desired brightness, are disclosed in the prior art, discovering the optimum range or workable ranges, i.e. the particular timing of the leading and trailing edges of the pulse with respect to the AM signal, involves only routine skill in the art. *In re Aller* 105 USPQ 233 (CCPA 1955). It has also been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205

USPQ 215 (CCPA 1980). In this case the result effective variable is the timing of the leading edge of the pulse with respect to the start of the AM signal ramp. In addition it would have been obvious to one of ordinary skill in the art at the time of the invention to take the rise time of the signals into account when determining their temporal relationship. The suggestion/motivation would have been to provide advantages such as to achieve the gray scale desired (see for example Graves column 2 lines 31-32).

### ***Conclusion***

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. 5,654,735 teaches inaccurate gray scales can result if sample pulse rise time causes inaccurate sampling of a signal.

U.S. 6,946,800 teaches AM on gate electrodes along with PWM.

U.S. 6,097,356 teaches AM and PM in combination and a look-up table for driving voltage values.

U.S. 6,844,874 teaches ramp voltage on rows with PWM on columns.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert R. Rainey whose telephone number is (571) 270-3313. The examiner can normally be reached on Monday through Friday 8:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amare Mengistu can be reached on (571) 272-7674. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/RR/



AMARE MENGISTU  
SUPERVISORY PATENT EXAMINER